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Patenting Improvements: The Costs of Making Patents Easily Available

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PATENTING IMPROVEMENTS: THE COSTS OF MAKING PATENTS EASILY AVAILABLE

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ABSTRACT

This article examines the economic costs that arise when patents are issued for improvements to previously patented inventions. These costs arise when an inventor patents an improvement on an earlier invention which the earlier inventor could have discovered for herself. The case law on combination patents provides some insight into these economic costs, and suggests that an inventor's patent monopoly should include an additional limited monopoly on improvements to her invention.

This article first discusses the law's view of the inventive process, and examines how that view has historically shaped the availability of patent protection. The article next discusses Congress's choice of a looser standard of patentability in 1952, and examines how this standard meshes with the economic underpinnings of the patent system. Finally, this article examines the economic costs that accompany the looser standard of patentability, and proposes an additional code section to separately govern patents on improvements to previously patented inventions.

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INTRODUCTION

In the middle decades of this century, courts viewed patent applications with a harsh eye, insisting that new inventions display a spark of genius that went beyond the work of mere technicians or mechanics.[1] In 1952, Congress enacted § 103 of the patent code,[2] replacing the previous judicial inquiries into the metaphysics of invention with a statutory requirement that a new invention be "nonobvious." In enacting § 103, Congress hoped to make patents more readily available.[3]

Most scholars have agreed that Congress's desire to make patents more readily available better serves the economic goals of our patent system.[4] In providing a looser standard for the issuance of new patents, however, Congress also limited the protection afforded to existing patents, since one patent's protection ends where another's may begin. Chief among the costs caused by this looser standard are the costs of having multiple inventors haggle over the property rights to a new consumer product. Economists refer to these increased transaction costs as bilateral monopoly costs, and they occur in the patent system most often when a later inventor patents an improvement on an earlier invention.

This article first discusses the patent law's view of the inventive process, and examines how that view has historically shaped the availability of patent protection. This article next discusses Congress's intent in enacting § 103, and further discusses how Congress's choice of a looser standard of patentability meshes with the economic underpinnings of the patent system. Finally, this article examines the economic costs that accompany the current looser

1. *See* discussion *infra* part I, and cases cited *infra* notes 8 and 9. *See also* Potts v. Coe, 145 F.2d 27, 28 (D.C. Cir. 1944): "[A] discovery which is the result of step-by-step experimentation does not rise to the level of invention; . . ." *See generally* Frank D. Prager, Standards of Patentable Invention From 1474 to 1952, 20 U. CHI. L. REV. 69 (1952-53).

2. 35 U.S.C. § 103 (1992).

3. *See* discussion *infra* part II.

4. *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265 (1977) and discussion *infra* part III.

standard of patentability, and concludes that the current statutory scheme is lacking; an inventor's patent monopoly should include an additional limited monopoly on improvements to his invention.

I. THE INVENTIVE PROCESS: MARKET AND NON-MARKET INVENTIONS

> The inventor was, however, encouraged in his efforts by the reflection that that which is hidden and unknown and cannot be discovered by scientific research, will most likely be discovered by accident, if at all . . .
>
> —Charles Goodyear, 1855.[5]

The law has traditionally recognized that invention is partly a sporadic, unpredictable and even unconscious process. The following passage from Joseph-Marie Montmasson's book on the cognitive process of invention illustrates this idea:

> In Newton's case, sitting under his apple tree, it was a flash of identification between solar and terrestrial attraction; . . . Without thinking about it, Torricelli made use of a barometer when he wished to test the pressure of the atmosphere; . . . In Daguerre's case it was the perception of the connection between the existence of mercury vapour and the appearance of the image on a photographic plate; this glimpse of a causal connection was a surprise, . . . Without thinking about it, Malus turned his prism between his fingers; and, after performing this movement unconsciously, he suddenly formulated his hypothesis on the polarization of light.[6]

Judges have long struggled to capture in words this sporadic aspect of invention. An early court looked for "creative work in the inventive faculty."[7] To Justice Douglas, invention was revealed in a "flash of creative genius;"[8] and for a while, courts struggled to determine when that flash had occurred.[9] Many courts, however, found that it was easier to determine what was not invention. The

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5. J. A. ALLEN, SCIENTIFIC INNOVATION AND INDUSTRIAL PROSPERITY 9-10 (1967) (citing J. JEWKES ET AL., THE SOURCES OF INVENTION 59 (1958)).

6. JOSEPH-MARIE MONTMASSON, INVENTION AND THE UNCONSCIOUS 115-16 (1932).

7. Hollister v. Benedict & Burnham Mfg. Co., 113 U.S. 59, 73 (1885).

8. "That is to say, the new device, however useful it may be, must reveal the flash of creative genius, not merely the skill of the calling. If it fails, it has not established its right to a private grant on the public domain." Cuno Eng'g Corp. v. Automatic Devices Corp., 314 U.S. 84, 91 (1941).

9. *See, e.g.*, Carlson v. Betmar Hats, 47 F. Supp. 86, 88 (S.D.N.Y. 1942); Wallace v. F. W. Woolworth Co., 45 F. Supp. 465, 466-67 (E.D.N.Y. 1942), *aff'd*, 133 F.2d 763 (2nd Cir. 1943), and *cert. denied*, 320 U.S. 739 (1943); Pennington Eng'g Co. v. Houde Eng'g Co., 43

court in *Hotchkiss v. Greenwood*,[10] for example, denied a patent to a method for manufacturing door knobs that consisted merely of substituting ceramic for metal, stating:

> [U]nless more ingenuity and skill . . . were required . . . than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention. In other words, the improvement is the work of the skillful mechanic, not that of the inventor.[11]

These various approaches to determining when invention occurred show the patent law's perception that new developments are of two principal types. There are, on the one hand, those inventions which are available only from the few individuals possessing the appropriate inventive genius—what this article calls non-market inventions.[12] These inventions have always been provided patent protection.

Additionally, there are inventions which can be purchased from any of a number of ordinary mechanics—what this article calls market available inventions. Historically, these inventions were not granted patent protection, either because the flash of inventive genius was lacking, or because the improvement was merely the work of a mechanic, not an inventor. When Congress enacted § 103, however, it opened the possibility that even market available inventions could receive patent protection.

II. SECTION 103

Congress enacted section 103 of the patent laws in 1952, for the first time establishing a statutory nonobviousness requirement for the issuance of patents. In relevant part, § 103 states:

> A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentabil-

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F. Supp. 698, 713 (W.D.N.Y. 1941), *aff'd*, 136 F.2d 210 (2nd Cir. 1943), and *cert. denied*, 320 U.S. 771 (1943).

10. 52 U.S. 248 (1851).

11. *Id.* at 267.

12. *Compare* Bleistein v. Donaldson Lithographing, 188 U.S. 239 (1903), in which the court extended copyright protection to commercially prepared advertising lithographs. Justices Harlan and McKenna, dissenting, felt the law should recognize the fundamental distinction between unique works of art and routine commercial art, and deny copyright protection to the latter.

> ity shall not be negatived by the manner in which the invention was made.[13]

In enacting § 103, Congress trumped the common law requirements of patentability, and sought to make patent protection more readily available to inventors. Significantly, courts no longer had to search for a flash of creative genius.[14]

P.J. Federico, a Patent Office examiner-in-chief and one of the principal drafters of § 103, noted that Congress deliberately chose moderate language for § 103, in the hope that courts would likewise moderate their strict approach to granting patent protection to new inventions.[15] Likewise, Judge Rich, chairman of the § 103 drafting committee, is said to have approved Federico's nonobviousness test "for the two purposes of (1) moderating the extreme strictness toward patents exhibited by the mid-century Supreme Court and (2) eliminating the incredible tangle of patentability tests."[16] As Federico wrote:

> While it is not believed that Congress intended any radical change in the level of invention or patentable novelty, nevertheless, it is believed that some modification was intended in the direction of moderating the extreme degrees of strictness exhibited by a number of judicial opinions over the past dozen or more years; that is, that some change of attitude more favorable to patents was hoped for.[17]

Congress implicitly reaffirmed its call for greater generosity in the granting of patents when, in 1982, it created the United States Court of Appeals for the Federal Circuit, and limited the jurisdiction of the Court of Customs and Patent Appeals.[18] As noted by Professors Kitch and Perlman:

> It was widely believed that the patent office was more liberal in construing the standard for a valid patent than were the District Courts and the Courts of Appeal, and the Court of Customs and Patent Appeal was part of the application process. Thus in transferring jurisdiction to review the validity of patents from the Courts of Appeal to the Federal Circuit, there was an implicit

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13. 35 U.S.C. § 103.

14. Graham v. John Deere Co., 383 U.S. 1, 15 (1966).

15. P.J. Federico, *Commentary on the New Patent Act, in* 35 U.S.C.A. 1, 23 (West 1954).

16. RICHARD L. GAUSEWITZ, PATENT PENDING 46 (1983).

17. Federico, *supra* note 15, at 22-23. For additional historical examinations of the evolution from a strict test of invention to section 103, see the collection of essays in part I of NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY (John F. Witherspoon ed., 1978).

18. Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, § 127.

> message that Congress would not particularly mind if the standard of patent validity was more generous to patents. Decisions of the Federal Circuit have been consistent with that implication.[19]

Congress's choice of a relaxed standard of patentability opened the possibility that some market available inventions could receive patent protection. An examination of the economic underpinnings of the patent system demonstrates that Congress's choice of a relaxed standard of patentability was appropriate.

III. THE ECONOMIC UNDERPINNINGS OF THE PATENT SYSTEM: EXTENDING PATENT PROTECTION TO MARKET AVAILABLE INVENTIONS

Many legal scholars have analyzed the economic underpinnings of the United States patent system. The early literature tended to focus upon the patent law's role in creating proper incentives for invention.[20] More recent literature has focused upon the patent law's role in assisting the commercial exploitation of inventions.[21] Both approaches indicate that patent protection should be extended to some market available inventions.

A. *The Incentive Purpose*

The first principal function of the patent system is to create incentives for the development of new products. Were an inventor unable to recoup the costs of her early failures by enjoying a limited monopoly on her successes, she would have little reason to try in the first place. The patent incentive is thus needed so that the first developer of a product may recover development costs which later manufacturers could avoid by free-riding off the inventor's work.

Traditionally, the patent law focused upon preventing later manufacturers from free-riding an inventor's discovery of how to make a new product. But only with non-market inventions do inventors spend significant resources to hurdle this obstacle. With market available inventions, large numbers of skilled mechanics already know (or can routinely discover) how to make new products. Accordingly, those who develop market available inventions often

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19. EDMUND W. KITCH AND HARVEY S. PERLMAN, LEGAL REGULATION OF THE COMPETITIVE PROCESS 748-749 (3d ed. 1986).

20. *See, e.g.*, Morris D. Forkosch, *The Economics of American Patent Law, in* CONTEMPORARY LAW PAMPHLETS, No. 2 (New York Univ. Sch. of Law Series No. 4, 1940).

21. *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J. L. & ECON. 265 (1977).

face only increased production costs—costs which are borne by all who are interested in producing the new product.

For instance, John Hotchkiss[22] likely did not expend great resources in discovering how to make ceramic door knobs, since the basic manufacturing method was the same as was used for metal door knobs. Rather, he likely spent his money in retooling his plant to produce ceramic knobs, but these retooling costs were borne by his competitors as well. John Hotchkiss simply did not suffer from the free-rider problem, and he accordingly did not need a patent law incentive to provide the market with his new type of door knobs. By focusing upon an inventor's costs of discovering how to make new products, the early patent law could thus rationally limit patent protection to non-market inventions.

Increasingly in a technologically advanced society, however, technicians may know how to make a new product, but may nonetheless face development costs which others may free-ride. Consider that a known antihistamine has undesirable side effects which a pharmaceutical company believes can be avoided. It may be that five new but routinely developed alternative drugs have a similar chemical structure, leading the company's researchers to believe that these alternatives would also act as effective antihistamines.

Everyone in the drug industry knows how to make a better drug—develop and test the five chemical alternatives and see which works best. The advance is thus market available, for it can be made by any of a number of technicians in the drug manufacturing industry. The problem, however, is that only the first manufacturer must develop and test all five alternatives. Later competitors can free-ride off the original company's efforts to determine which alternative works best. It thus often makes economic sense to provide patent incentives for inventors to develop even market available inventions.

Indeed, the Court of Appeals for the Federal Circuit has recently addressed this issue. In *In re Fine*,[23] the court reversed the Patent and Trademark Office's determination that a device to measure minute quantities of nitrogen compounds was obvious. The device was similar to a previously known method for converting nitrogen compounds into nitrogen dioxide, a chemiluminescent compound whose luminescence could be measured to show the level of the original nitrogen compounds. The Patent and Trademark Office thought it would have been "obvious to try" the substitution

22. *See supra* note 7 and accompanying text.
23. 837 F.2d 1071 (Fed. Cir. 1988).

and combination of known devices, and that the device was thus obvious under § 103.

The appellate court did not disagree that the substitution might have been obvious to try, but rather held that "whether a particular combination might be 'obvious to try' is not a legitimate test of patentability." The court required that the resulting combination be suggested by "then-accepted wisdom in the art" to be obvious — and hindsight (especially in light of subsequent success of a given combination attempt) could not be used to establish the obviousness of the combination.[24]

If a given advance is obvious to try, it follows that it can be developed by any skilled technicians in the industry who are willing to proceed with the try. By extending patent protection to inventions that are obvious to try, the court properly allowed some market available inventions to be patented.[25]

B. *The Commercial Exploitation Purpose*

A second purpose served by the patent system, first addressed by Professor Kitch,[26] is to assist the commercial exploitation of new products. The costs of making new products available to consumers, he argues, will be most efficiently expended if a central patent holder directs the steps to full commercial exploitation. Consider the drug manufacturer who has developed a new antihistamine. Without the monopoly provided by a patent, this manufacturer and other manufacturers would, at the same time, all be seeking government approval for the new drug; all of the manufacturers would simultaneously prepare and submit safety and efficacy reports; all of the manufacturers would simultaneously begin advertising campaigns to inform consumers of the new medical advance. Professor Kitch argues that a single manufacturer can most efficiently coordinate these startup costs, and that the patent law monopoly efficiently assigns control over the startup process to a single manufacturer.

Consequently, an important patentability factor is how much more work must be done to bring a new product to the marketplace. This inquiry can often suggest that market available inventions should be patented. As Professor Kitch illustrates in his discussion

24. *Id.* at 1075.

25. *See also* Betram I. Rowland, *Obvious to Try—A Nonstandard of Patentability, in* NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY, *supra* note 17, at 7:201.

26. Kitch, *supra* note 21.

of the Supreme Court case of *Sakraida v. Ag Pro, Inc.*[27]:

> The invention was for an automated system of cleaning waste from dairy barns. . . . If one looks at this patent from the perspective of the reward [incentive] function, one sees an unimaginative application of the natural forces of water, controlled by known automation devices, to move cow droppings from one point to another. The Supreme Court conceived of the question to be decided as: Is this worth a monopoly?[28]

Concluding that the automated barn cleaning system was merely "the work of the skillful mechanic, not that of the inventor," the Supreme Court refused to grant a patent monopoly for the new device.[29] The barn cleaning system was, in other words, a market available advance which did not require patent law incentives to be developed. Nonetheless, Professor Kitch argues that the patent for the barn cleaning device should have been upheld:

> If one looks from the perspective of the prospect function, one sees all the problems of designing and marketing a reliable, durable, and efficient system for automatic barn cleaning. Imagine the reaction of the first dairy farmer approached with the suggestion that he should make a large investment to equip his barn with pumps, pipes, hoses, nozzles, automatic controls and specially designed sloping floors to keep it clean. Imagine the costs involved in designing a commercially acceptable system, proving its value to the dairy farmers of America, and inducing them to pay its cost? The investments to achieve these objectives will be more efficiently made if the patent is held valid.[30]

In a modern industrial society, newly developed products may face an array of obstacles before they reach consumer shelves. The costs of safety testing to meet government standards, the costs of modern marketing techniques and the costs of carefully refining products to meet consumer tastes are just some of the burdens that

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27. 425 U.S. 273 (1976).

28. Kitch, *supra* note 21, at 284.

29. *Sakraida*, 425 U.S. at 279 (citing Hotchkiss v. Greenwood, 52 U.S. 248 (1851)).

30. Kitch, *supra* note 21, at 284; *see also* Dorr Co. v. Yabucoa Sugar Co., 119 F.2d 521 (1st Cir. 1941), where the court recognized the extensive time and effort expended by an inventor, after developing a product, to convince consumers of the products' benefits. The court wrote:

> It is not surprising that sugar manufacturers should have hesitated to scrap existing installations and methods conceded to have been commercially successful, until the claimed economies and increased efficiency resulting from the use of [the claimed invention] should have been demonstrated by quite extensive experiments.

Id. at 524.

today's inventors face after developing a new product. Both non-market inventions and market available inventions face these obstacles, however. Consequently, the commercial exploitation purpose served by the patent laws also suggests that patent protection should extend even to market available inventions.

In summary, Congress's desire to expand patent protection, its choice of a looser standard of nonobviousness, the economic underpinnings of the patent system and recent case law all suggest that, under § 103, even market available inventions should be patentable. Since § 103 also delineates the breadth of patent protection, this looser standard of patentability creates economic costs as well.

IV. THE ECONOMIC COSTS OF PATENTING MARKET AVAILABLE INVENTIONS: A NEW CODE SECTION IS NEEDED TO DELINEATE PATENT SCOPE

Bilateral monopolies, a common economic cost, occur when two or more persons find that they must deal solely with each other to take advantage of a beneficial transaction.[31] The time and energy spent in settlement negotiations provide an example of bilateral monopoly costs familiar to most attorneys.

As discussed below, in the patent system, bilateral monopolies occur whenever the level of patent protection is too broad or too narrow. The level of protection afforded to a patent, however, is currently governed by the availability of new patents; one inventor's patent ends where another's patent may begin. This creates problems when an inventor finds that another has patented an improvement to his invention, and the two must deal solely with each other to place the improved product on consumer shelves.

Accordingly, as courts permit greater numbers of patents to be issued under § 103, they also decrease the protection afforded to existing patents, and create unnecessary bilateral monopoly costs.

A. *The Optimal Level of Patent Protection*

A quick examination of the bilateral monopoly problems encountered by the patent system reveals the optimal level of patent protection: an inventor's patent monopoly should extend to all market available improvements to his invention.

The first type of bilateral monopoly that the patent system must confront arises when patent protection extends too far beyond the inventor's work. For a drastic example, imagine that patent

31. *See* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW § 3.7 (3d ed. 1986).

rights were issued to anyone who filed an idea for a new product. Jenny Q. Public could file a patent for a three dimensional television and, having neither the ability nor desire to develop such an invention, wait for someone more inventive than she to arrive at her doorstep to purchase, after much haggling, her patent rights. This particular bilateral monopoly problem is easily avoided by having a requirement that a patent application disclose how the claimed invention is made.[32]

Similarly, if patent protection were allowed to cover significantly more than the inventor's specific invention, bilateral dealings would result. The hornbook case of *O'Reilly v. Morse*[33] provides a good example. In that case, the Supreme Court struck down one of Samuel Morse's patent claims for his telegraph invention. Samuel Morse attempted to claim under his patent all

> use of the motive power of the electric or galvanic current, which I call electromagnetism, however developed for marking or printing intelligible characters, signs, or letters, at any distances, being a new application of that power of which I claim to be the first inventor . . .[34]

Had Samuel Morse's claim been upheld, the teletype machine, the telex machine, cable television, the fax machine, and integrated computer networks would all have fallen under Morse's patent. The various inventors of these devices would have found themselves haggling with Mr. Morse over appropriate licensing fees.[35] This problem led an early court to proclaim:

> A claim broader than the actual invention of the patentee is, for that very reason, upon principle of the common law, utterly void, and the patent is a nullity.[36]

A patent system should not, however, shrinkwrap patent protection around an invention, for then a different form of bilateral dealing arises. For example, if protection were narrowly transcribed, the inventor of the electric refrigerator might fall prey to the first person to conceive of, and patent a method for, separating the refrigerator into two independently regulated insulated compartments—the refrigerator/freezer. The classic bilateral monopoly would arise because neither of the parties could manufacture

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32. 35 U.S.C. § 112 (1992).

33. 56 U.S. 62 (1854).

34. *Id.* at 85.

35. This example is designed merely to illustrate the bilateral monopolies that arise from overly broad patent rights. The limited duration of Mr. Morse's patent is thus ignored.

36. Wyeth v. Stone, 30 F. Cas. 723 (C.C. Mass 1840)(No. 18,107).

and sell the improved unit without the other's consent; the later inventor would indeed be building a refrigerator and would thus, without license, infringe the original patent, while the original inventor could not sell the improved product without infringing the other's patent.

These examples illustrate some of the intuitive force behind the early law's focus on the sporadic genius behind inventions. Because inventions were viewed as being sporadic, the courts could not expect Samuel Morse to discover all of the future advances in electromagnetic transmission of data. His patent claim thus had to be limited, or bilateral dealings would result when later inventors made these advances. Consequently, the law made the facial assertion that a patent could cover no more than the actual invention.[37]

At the same time, however, the courts could expect an inventor to make on her own any market available improvements to her invention. Consequently, to prevent blocking patents and the ensuing bilateral monopoly costs, the law refused to allow others to patent these improvements.[38] By finding that these improvements lacked the genius of invention, the courts provided the necessary breathing space for an inventor to fully exploit all market available improvements to her invention.[39]

Because the patent law does not differentiate between new inventions and improvements to existing inventions, § 103 indirectly determines the amount of breathing space afforded to a new inventor. Under the current system, an inventor can fully exploit only those improvements which others do not patent. Accordingly, if the law recognizes a strict non-obviousness standard that creates the proper scope of patent protection—one that allows inventors to make all market available improvements themselves—then other market available inventions will be denied patent protection. Alternatively, if § 103 is broadly interpreted to allow the proper economic incentives for invention and commercial exploitation,[40] then bilateral dealings will result when market available improvements are patented. As revealed in the case law concerning combination patents, the law has struggled unsatisfactorily to deal with this problem.

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37. *Id.*

38. *See* discussion *supra* part I.

39. This approach still allows inventors to patent truly unique (non-market) improvements on another's invention. And while blocking patents could thus still arise, the benefit of having a new advance that would otherwise remain unfound would most certainly outweigh the bilateral monopoly costs.

40. *See* discussion *supra* part III.

B. *Combination Patents*

A combination device is an assembly of previously known products to create a new unit.[41] Combination devices are thus a unique type of product improvement, and the patent law's approach to combination devices reveals some of the costs that arise when improvements are treated like other inventions.

Because combination devices do not contain new elements, some courts, prior to the enactment of § 103, saw in these devices a lack of the sporadic genius of invention needed for patentability. For example, in *Great Atlantic and Pacific Tea Co. v. Supermarket Equipment Corp.*,[42] the claimed invention was a grocery counter equipped with a rack for moving groceries from the customer to the clerk. The court held the invention unpatentable, establishing what subsequently became known as the synergism test:[43]

> The conjunction or concert of known elements must contribute something; only when the whole in some way exceeds the sum of its parts is the accumulation of old devices patentable.[44]

The absence of such synergism, the court reasoned, displayed an absence of invention.[45]

When Congress enacted § 103 in 1952, it appeared to sweep aside such searches for invention.[46] And the first Supreme Court cases decided after § 103 was enacted bolstered this view.[47] In *Graham v. John Deere Co.*[48] and *United States v. Adams*,[49] the Supreme Court addressed the patentability of two combination devices. In *Deere*, the claimed invention was an improvement to a plow made by reversing the placement of a hinge plate. All of the elements of the invention were the same as before.[50] In *Adams*, the inventor had made a battery having cuprous chloride and magnesium elec-

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41. *See* Carson Mfg. Co. v. Carsonite Intern. Corp., 686 F.2d 665, 667-68 (9th Cir. 1981).

42. 340 U.S. 147 (1950).

43. The Supreme Court first phrased its inquiry in terms of synergism in Anderson's-Black Rock, Inc. v. Pavement Salvage Co., 396 U.S. 57, 61 (1969). On synergism generally, see James W. Geriak, *Synergism—The Artificial Barrier to Patentability, in* NONOBVIOUSNESS—THE ULTIMATE CONDITION OF PATENTABILITY, *supra* note 17, at 7:301.

44. *Great Atlantic*, 340 U.S. at 152.

45. *Id.* at 152-54.

46. *See supra* note 14 and accompanying text.

47. *See* Edmund W. Kitch, *Graham v. John Deere Co.: New Standards for Patents*, 1966 Sup. Ct. Rev. 293. Professor Kitch concluded that "only the [non-obviousness test] survives the decision in *Deere*." *Id.* at 297.

48. 383 U.S. 1 (1966).

49. 383 U.S. 39 (1966).

50. *Graham*, 383 U.S. at 23.

trodes. Although the two types of electrodes had never before been used together, they were both used separately in other batteries.[51] The invention contained no new elements. The Supreme Court decided both cases by referring to § 103, looking for: the scope and content of the prior art; differences between the prior art and the claims at issue; and the ordinary skill in the pertinent art.[52] Apparently content with the nonobviousness test in § 103, the court did not search for synergism, and it did not delve into the metaphysics of invention.

But three years later the Supreme Court resurrected the synergism test in *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*,[53] a case which involved the validity of a patent on a paving machine which combined in one unit a specific kind of radiant heater and a bituminous concrete paving machine.[54] The combination was able to solve a long standing road deterioration problem caused by the cold joint between a road section being laid, and the previously laid section.[55] In striking down the claimed patent, the Court reverted to its pre-section 103 inquiry. The Court wrote:

> A combination of elements may result in an effect greater than the sum of the several effects taken separately. No such synergistic result is argued here. It is, however, fervently argued that the combination filled a long felt want and has enjoyed commercial success. But those matters "without invention will not make patentability."[56]

And again in *Sakraida v. Ag Pro, Inc.*,[57] as discussed above, the Court struck down a patent on a barn cleaning system that used the well-known elements of flush troughs, a sloping floor and a water storage tank.[58] The Court again invoked the language of synergism, finding that the lack of synergism was likewise a lack of patentable invention.[59]

The Supreme Court's contrasting approaches to combination patents wreaked confusion in the patent bar, and rekindled judicial inquiries into the metaphysics of patentable invention. The Court's

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51. *Adams*, 383 U.S. at 51-52.
52. *Deere*, 383 U.S. at 17; *Adams*, 383 U.S. at 51-52.
53. 396 U.S. 57 (1969).
54. *Id.* at 58.
55. *Id.*
56. *Id.* at 61 (citing Great Atlantic & Pacific Tea Co. v. Supermarket Equip. Corp., 340 U.S. at 153).
57. 425 U.S. 273.
58. *Id.* at 275-76 & n.2.
59. *Id.* at 281-82.

rulings created a split amongst the circuit courts[60] that lasted until Congress created the Court of Appeals for the Federal Circuit which finally replaced the circuit cacophony with national unity.[61] But the apparent inconsistencies in the Supreme Court's decisions remain unresolved.

A closer examination of the circumstances surrounding *Anderson's-Black Rock*, however, helps explain the Court's stricter treatment of patentability in that case, and further demonstrates the need for a new approach to patent protection.

The heart of Pavement Salvage's claimed invention was a special type of propane-fired radiant heater which was then attached to a standard paver. The heater allowed highway builders to effectively fuse new patches of road with previously laid segments by heating the joint during paving.[62] While this method had been tried before, the earlier heaters either damaged the road or were too inefficient. Pavement Salvage's machine was indeed the first to eliminate what was known as the cold joint problem.[63]

Significantly, the type of heater incorporated into Pavement Salvage's paving machine was new on the market and had itself been recently patented. Pavement Salvage used a Schwank heater, patented by Gunther Schwank in 1956.[64] The patent on Pavement Salvage's machine was filed by Charlie Nelville only three years later, in early 1959. In fact, Mr. Nelville's lawyer had begun work on the patent application for the paving machine in 1957, approximately only one year after the Schwank patent issued.[65]

Looking at the case not from Charlie Nelville's perspective, but rather from Gunther Schwank's position, we see the inventor of a highly useful and efficient radiant heater finding that others are quickly patenting ways to use his invention—uses that he could have discovered and exploited himself. Had the Court sustained Nelville's patent, Gunther Schwank would have found himself locked in the familiar bilateral monopoly. Pavement Salvage would have been dependent upon him for supplying them with heaters,

60. The various approaches taken by the Courts of Appeal are reviewed in Kevin J. Lake, *Synergism and Nonobviousness: The Rhetorical Rubik's Cube of Patentability*, 24 B.C. L. REV. 697, 716 nn.130 & 136 (1983).

61. *See* Connell v. Sears, Roebuck & Co. 722 F.2d 1542, 1548 (Fed. Cir. 1983) and Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1555-57 (Fed. Cir. 1985), asserting that there is no synergism requirement.

62. *Anderson's-Black Rock*, 396 U.S. at 58-59.

63. Pavement Salvage Co. v. Anderson's-Black Rock, Inc., 404 F.2d 450, 450-51 (4th Cir. 1969).

64. *Id.* at 452.

65. RICHARD L. GAUSEWITZ, PATENT PENDING 111-12 (1983).

while he would have been unable to sell his heater to any paving companies without routing them through Pavement Salvage Company.

Combination patents come in two types. They can, like the one in *Anderson's-Black Rock*, act as blocking patents on previous inventions. In such instances, the law has already granted a patent monopoly to the underlying inventor—a monopoly that should provide sufficient incentives for the underlying inventor to develop all market available improvements to his invention. Further, if a combination patent is allowed to coexist with an underlying patent, society no longer benefits from the cost savings of having a central patent holder coordinate the commercial exploitation of the invention.[66] In these circumstances, granting a patent to the inventor of a market available combination device only creates unnecessary costs.

Combination patents can also be issued to inventors who use old elements in new ways without encroaching on existing patents. As such, these patents perform the same economic functions as all other patents, and should be governed by the general rules for non-obviousness. These two patterns may help explain the two approaches to synergism that dominated the patent law in the 1960's and 1970's.

As we have seen, § 103's standard for determining when a patent is available also indirectly governs the protection afforded to existing patents. This dual role creates unnecessary bilateral monopoly costs, as inventors must haggle with those who improve their inventions to coordinate their joint property rights in the improved invention.

The current framework for patenting inventions, however, leaves little room for differently treating claims for improvements on existing patented inventions, and those for other inventions. Section 101 of the patent act specifically includes in the category of patentable advances "any new and useful improvement."[67] A statutory addition to the patent act, however, would correct the problems identified in this article.

C. *Proposal: A New Code Section*

Proposed Section 105. Patent Scope.

For a period of seven years after the Commissioner properly is-

66. *See supra* note 21 and accompanying text.
67. 35 U.S.C. § 101 (1992).

> sues a patent to an inventor, the inventor shall have the exclusive right to claim, by filing notice with the Commissioner, any improvements upon and novel uses of her invention which would be routinely ascertainable after diligent search by one skilled in the art to which the invention pertains. Any claim made under this section shall become a part of the originally issued patent.

This, or a similar statute, would correct the flaws that this article has found in the current patent system. By granting to the inventor the exclusive right to claim all "routinely ascertainable" improvements discoverable after "diligent search," the proposal allows an inventor to fully exploit all market available improvements to her invention, while leaving room for others to patent non-market improvements which the original inventor cannot be expected to find. As we have seen, this eliminates unnecessary bilateral monopolies.

Additionally, by assigning the patent rights for market available improvements to a central patent holder, the proposed statute would prevent the unnecessary costs of having multiple inventors simultaneously rushing to develop market available improvements. Under the proposed section, the inventor of a new product could alone develop, at the most efficient pace,[68] all market available improvements to her invention.[69]

Society would benefit by the cost savings of having a single inventor efficiently working to develop market available improvements even if the inventor of a new product lacked the ambition to herself develop the market available improvements to her invention. Because patent claims are publicly filed,[70] those more ambitious than the original inventor could easily contact the inventor, purchase her patent rights, and develop the improvements themselves. Alternatively, more ambitious inventors could seek a license, or simply sell their services to the initial inventor.[71] In all instances, because of the large number of other inventors who could develop market available improvements,[72] the transaction costs would not be high; if a potential licensee was unreasonable, for ex-

68. Because the proposed statute provides only a seven year safe harbour, an inventor would still confront the diseconomies of speed for improvements which would otherwise take longer than seven years to develop.

69. *See* Kitch, *supra* note 21, and the accompanying discussion, *supra* part III(B).

70. Rules of Practice in Patent Cases, 37 C.F.R. § 1.11 (1991).

71. This is an application of the Coase Theorem, which posits that regardless of its initial assignment, a property right will be transferred to its optimum use (in the absence of prohibitive transaction costs, such as bilateral monopolies.) *See* Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960). *See also* POSNER, *supra* note 31, at 7, 43-45.

72. *See* discussion *supra* part I.

ample, the initial inventor could find someone else, or simply develop the market available improvements herself.

Further, by limiting the protection offered for improvements to a period of seven years, this proposal ensures that an inventor will act promptly to develop improvements. The time period also acts to lessen the costs of incorrectly identifying an improvement as a market improvement. If an inventor cannot develop an improvement within seven years, it makes sense to presume that the improvement is a non-market improvement that should be patentable notwithstanding the potential bilateral monopolies.[73]

Finally, by providing that claims made under the section become part of the original patent, the section prevents an inventor from repeatedly extending her statutory monopoly by filing improvement claims. This approach again gives an inventor an incentive to make all improvements as quickly as possible—an approach that will directly benefit consumers.

CONCLUSION

The patent law has long viewed inventions as coming in two types: market available inventions and non-market inventions. While patent protection properly extends to some market available inventions, if patent improvements are not regulated separately from § 103, bilateral monopolies will result. Because our current patent system treats patent improvements like all other patents, the case law has floundered in confusion. It is time for Congress to enact a separate statutory provision to help govern patent improvements.

73. *See supra* note 39 and accompanying text.